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a critique
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11/16/67

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REC'D TTY REPORT

[REDACTED]

25X1A2g

1 Sept 66 - 15 Jan 67

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from [REDACTED] Site Engineer, subject: [REDACTED] Lower
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SUMMARY

Delayed and damaged GFM, and a breakdown in communications between Headquarters and the COB were the most significant problems encountered during the course of this TDY. The delayed GFM set the rate of the job and prevented earlier completion. The breakdown in communications between Headquarters and the COB resulted in a negative climate which definitely influenced the COB's conduct towards those who represented the Headquarters element. Although this report stresses problem areas, it is not intended to diminish the fact that the [REDACTED] construction is rapidly nearing completion under what have been extremely difficult field conditions.

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Recommendations at the end of this report suggest means of eliminating the aforementioned and other problems by establishing procedures which insure greater Supply Division project participation, designate permanent "project engineers", and call for the establishment of direct [REDACTED] Contractor relationships. It should be noted that these Recommendations are based on field observations which to some degree may be altered by Headquarters considerations unknown to this writer.

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S E C R E T

1. Engineering Problems

1.1 Drawings

25X1C4e The [redacted] construction drawings were, for the most part, satisfactory. However, in several critical areas, they were somewhat lacking in detail, incorrect, and incomplete.

25X1C4e The Upper Camp Operations Building air conditioning drawing, for example, was somewhat lacking in detail. The Contractor [redacted] 25X1C4e and the [redacted] Site Engineer were unable to determine the air conditioning piping layout from this drawing. It should be pointed out that a person with U.S. equivalent air conditioning experience would probably have been able to devise and install a suitable air conditioning piping system without detailed drawings. However, the Upper Camp Specifications only stipulated that "...the installation shall be accomplished by workmen skilled in this type of work..."¹ The Contractor's position, generally supported by [redacted] was that he would provide people skilled, by local standards, in the physical installation of the air conditioning piping, but that this did not mean that these persons must be able to devise a suitable piping system. The impasse was resolved when a [redacted] Electrical Engineer then at the site agreed to supervise the complete powerhouse installation while the Contractor would commission a European air conditioning master to devise and install a suitable air conditioning piping system. 25X1C4e 25X1A2g

In several areas the manufacturers as well as the contract drawings were incorrect. The palletizer perma-walk drawings, for example, were impossible to follow because the drawings were obviously drawn for a type of palletizer other than that provided. In the end, these drawings were discarded and the perma-walk was completely reconstructed. In other instances, the drawings were incorrect in that they specified items to be GFM,² which were Contractor-furnished, and other items to be Contractor-furnished, which were GFM.³

¹Section M2-07, AIR CONDITIONING EQUIPMENT, Specifications for Upper Camp Facilities, May 1966.

²Generator Anchor Bolts, Upper Camp
Motor Pool Fuel Pump, Lower Camp

³Unit Heater Fuel Pump, Lower Camp

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25X1A2g The most serious problems with the drawings, however, resulted from the fact that they were incomplete. Although [REDACTED] was advised, in writing,⁴ more than a month prior to the signing of the Lower Camp contract that seven [REDACTED] drawings had been omitted, they failed to include these drawings in the final contract drawings. In fact, the omitted drawings had still not been provided three months later and the Contractor was forced to use unofficial drawings provided by the [REDACTED] Site Engineer.

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1.2 Specifications

25X1A2g The specifications were sometimes unclear as to responsibilities, occasionally wrong, and often unrealistic. As a result, they were generally ignored by [REDACTED] and the [REDACTED] Site Engineer. An effort was made by all concerned to provide what was considered by the Government Representatives to be good engineering practice under the existing field conditions.

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The lack of clarity of the specifications is best illustrated by the following examples. In connection with the Upper Camp air conditioning the Contractor was requested by the [REDACTED] Site Engineer to balance the system and conduct a performance check. The Contractor at first refused to perform these operations based on the argument that the specifications did not require it. In fact, neither Specification M2-15, AIR BALANCING, or M2-16, PERFORMANCE, of the Upper Camp Specifications stipulate that the Contractor shall perform these operations. In the end, the Contractor did decide to balance the system and conduct a performance test.

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In another instance an attempt was made to get the Contractor to operationally test the Upper Camp generators. The Contractor refused to take any responsibility for the operation of these units again based on the argument that the specifications did not require him to do so and because he felt he could not assume any responsibility for mistakes which may have occurred at the factory. Specification E3, GENERATING UNITS, DIESEL-ELECTRIC, Upper Camp Specifications, refers only to the "installation" and not the "operational testing" of the generating units. Fortunately, there was a [REDACTED] Electrical Engineer

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⁴See Appendix A.

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at the site at the time who was able to correct factory errors which actually did exist in the wiring of the generators.

In some cases the specifications were simply wrong as with Specification C-4, FENCE, CHAIN LINK, Lower Camp Specifications for the "...erection of Government-furnished chain-link fence, complete..." Although this fence was neither intended to be GFM nor was it included in the list of GFM, the Contractor simply stated that since the specification referred to it as GFM, and the drawings did not contradict this, he assumed it was GFM. In the end, the fence was purchased by the Government.

In many cases the specifications were simply unrealistic. For example: Lower Camp Specification SP-08, SHOP DRAWINGS, requires that the Contractor submit shop drawings on GFM; Lower Camp Specification SL-05, (CONCRETE) SAMPLES AND TESTING, requires that the Contractor provide test cylinders when no [REDACTED] test lab existed in the country for testing them; Lower Camp Specification SL, CONCRETE, and C-3, STABILIZED-AGGREGATE BASE COURSE, require aggregate gradations which the Contractor could not possibly have met using the local river gravel he had been given permission to use; and Lower Camp Specification E3, GENERATING UNITS, DIESEL ELECTRIC, CLEANING AND PAINTING OF UNDERGROUND TANKS, requires that the underground tanks be coated with coal-tar enamel even though the Contractor states that he told [REDACTED] at the time the specification was written that coal-tar enamel could not be obtained in the country and that he had no intention for coal-tar enamel and substituted cut-back asphalt.

1.3 Government-Furnished Materials

Most materials, with the exception of the palletizer units, arrived at the site in good condition. However, the rate of progress of the job was constantly set by the rate of arrival of the GFM.

Most mechanical and electrical items arrived in good condition. However, one transformer was damaged and the air conditioning arrived with all of the mechanical linkages loose.

The [REDACTED] in particular, arrived in excellent condition. This resulted primarily from the fact that all members were packed with heavy timbers and angle iron covers on all corners. Minor erection difficulties were encountered in that all parts were not good matches and it was necessary to use a cutting torch on many holes and some lengths.

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The condition of the palletizer units on the other hand was only generally fair and in the case of the erected units, deplorable. The perma-walk, for example, had to be completely reconstructed. The Upper Camp wash car was so completely damaged that it required 200 man hours at considerable cost to repair it. The interior stalls of the wash car were completely broken out, pipes were broken, the interior wall covering was ripped, and the water closets were broken. The unit was so constructed that repairs were very difficult to make, i.e., mastic sealed plastic sewer pipe and inaccessible soldered water pipe connections. Most of this damage resulted from the fact that there was no packing of the erected units. The Lower Camp units, with the exception of the erected units, were not severely damaged. However, at least one-third of the units suffered some water damage resulting in loose and broken linoleum. These units also suffered some damage to the exposed panel corners resulting from the inadequate packing in 1/4-inch plywood.

The rate of progress of the job was constantly set by the rate of arrival of the GFM. For example: from 19 September 1966 to 18 October 1966 the Contractor was delayed awaiting the arrival of the Operations Building Solex Lights, approximately 50 meters of chain-link fence, the water pumps and pressure tanks, and the power house unit heater; from 16 December 1966 until 9 January 1967 the Contractor was delayed on the Lower Camp wiring installation because the GFM wire had not arrived; and from 7 January 1967 until at least 15 January 1967 the Contractor was delayed on the palletizer erection because the GFM fasteners, flashing, and the equipment had not arrived.

2. Change Orders

Change orders were issued either out of engineering necessity or because there was a need for facilities over and above those called for in the basic contract. During the period of this TDY no change order requested by the COB was ever refused.

2.1 Upper Camp

The final number of change orders was between 40 and 50. The exact number is unknown since no formal procedure existed for itemizing and controlling these work items.

2.2 Lower Camp

During the period of this TDY, twenty-six change orders were issued to [REDACTED]. A rigid procedure for issuing these change orders was followed in each case. Once it was agreed by the [REDACTED] Site Engineer and the COB that a change order was necessary, a formal, signed document was prepared and given to [REDACTED].

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This document included a change order number, descriptive title, verbal description, applicable specifications, and an engineering sketch. A summary of the Lower Camp change orders issued to [REDACTED] is given in Appendix B.

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In addition to the above twenty-six change orders, four change orders were being issued and administered directly by the [REDACTED]. These change orders were for: (1) construction of an indigenous toilet in the Industrial Area; (2) installation of interior partitions, interior electrical work, and heating units in the [REDACTED] Buildings; (3) installation of interior palletizer plumbing; and (4) construction of a ammo line from the Upper to the Lower Camp.

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3. Field Support

3.1 Station

The Station logistical support was very good. The Log Officer obtained all materials that were requested and delivered them to the site within the time limits specified. On one occasion he was able to completely fabricate and deliver to the site several hundred anchor bolts of widely different sizes in less than five days.

3.2 Base

A large amount of material support, including galvanized antenna hardware and special tools which were not available in the country, was provided by the Base. During Upper Camp construction this material was provided only with the greatest reluctance and solicitude. However, during Lower Camp construction the situation improved and all requested support was freely provided.

3.3 [REDACTED]

[REDACTED] were capable and the inspection provided was good. In several instances, these representatives suggested valuable engineering changes which were incorporated by change order.

On the other hand, support provided by the District Office was very poor. For example, although the Chief of the District Construction Branch was informed, in writing,⁵ as early as 11 September 1966

⁵See Appendix A.

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that seven Lower Camp drawings had been omitted from the preliminary Lower Camp drawings, he failed to include these drawings, or other changes requested in the letter, in the final contract drawings released to the Contractor on 22 October 1966. He stated that there was not sufficient time to make the requested changes or include the missing drawings. As a result most of the omitted work and requested changes had to be performed on a change order and more expensive basis.

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In another instance, [REDACTED] was requested to design and prepare a scope of work for a steel frame generator building and guard house. Although they agreed to provide these services, they actually provided only drafting services and the [REDACTED] Engineers then at the site had to do the complete design including all details.

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In still a third instance, following Upper Camp completion the [REDACTED] visited the site and insisted that on the Lower Camp construction all change orders must be forwarded to him for approval and that he in turn would immediately issue the order to proceed on the change order to the Contractor. However, although twenty-six change orders were forwarded to the [REDACTED] in the period 14 October 1966 through 25 December 1966, the Contractor as of 29 December had not received the first order to proceed from [REDACTED] on this change order work. Letters and messages to the [REDACTED] inquiring about these change orders were never answered. As a result, the Contractor in practice began working on these change orders on the basis of carbon copies of signed correspondence sent from the [REDACTED] Site Engineer to [REDACTED]

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As a final example, representatives of [REDACTED] Office stated on 11 December 1966 that a design for the Upper-Lower Camp Commo Line would be ready in approximately one week for change order negotiations. Although [REDACTED] repeatedly requested information on the status of the design, no answers were forthcoming. On 29 December 1966 the [REDACTED] Site Engineer requested by message that change order negotiations on the Commo Line be initiated immediately. On 30 December an answer was received at the site stating that the design would be ready on 2 January 1967. On 15 January preliminary Commo Line drawings were finally received at the site and were unsatisfactory. The drawings were standard [REDACTED] details using hardware only available in the U.S. and using steel poles buried 6 feet in solid rock. On 18 January 1967 a meeting was held with [REDACTED] representatives to discuss the design. At this meeting it was decided that a completely underground line would be the most economical. Finally, on the afternoon of 18 January 1967 the Contractor was approached officially [REDACTED] concerning this work.

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4. Contractor Evaluation

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4.1 Personnel

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The project manager and site superintendent were permanent  Other site personnel, with the exception of several international foremen, were indigenous employees with limited skill levels hired for the duration of the job. Although the Contractor was able to realize a financial saving through the use of large numbers of indigenous employees, the quality of the work and adequacy of the supervision suffered accordingly.

4.2 Workmanship

The workmanship was excellent by local standards, but was only average by U.S. or European standards.

4.3 Financial Resources

The Contractor was capable and willing to continue the job even when payments were not forthcoming. As a case and point, the Contractor received the first partial payment for the Upper Camp construction on 24 October 1966 at a time when construction was over 98 percent complete.

4.4 Organization

The Contractor's headquarters organization is divided into four main divisions: (1) Industrial; (2) Highways and Roads; (3) Buildings; and (4) Heavy Construction. The head of the Buildings Division is in charge of all overseas operations. Overseas operations are in turn broken down geographically. Each overseas office apparently has a large measure of autonomy and only depends on the headquarters element for financial and some logistical support. The Site Superintendant on this job had full authority to accept for the company any change orders. The Project Manager had contracting authority in the neighborhood of one million dollars.

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5. Field Criticism of the Construction Project

The COB's criticisms of the construction project are given below. These criticisms are not necessarily true, but are particularly important because they represent a breakdown in communications which definitely influenced the COB's conduct towards those who represented the Headquarters element.

5.1 Project Management

The COB was of the opinion that although he was responsible for all field activities in his area, he was neither sufficiently consulted nor kept adequately advised of the plans, schedules, and Headquarters actions connected with the construction project.

5.2 Construction Commitments

The COB felt that various RECD personnel had made construction commitments which they had failed to honor. By way of example, he states that he was assured that the final plans would include a security fence around the entire Lower Camp area and a communications line from the Upper to the Lower Camp. These items were not included in the final plans.

6. Recommendations

6.1 Technical

a. The use of local materials and methods of construction should be stressed on all projects where construction time is the primary consideration.

b. When local materials and methods of construction are inadequate and time permits, prefab metal buildings should be used in preference to palletizer type construction for all purposes including housing.

c. If palletizer type construction is used, it should be restricted to the "basic" housing units only. The use of erected units and units requiring flashing or plumbing work should be eliminated. The only exception to this would be the use of palletizer construction which is completely transported, erected, and sold erected-at-site by the manufacturer.

d. No prefab units of any type should be purchased without, as a minimum, an inspection as to the adequacy of the packing.

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e. On all jobs involving a great deal of GPM a Supply Officer should be assigned to RECD to advise on lead times, prepare all orders, verify the adequacy of all packing, follow up on all shipments, and function as the final authority on all project supply or procurement matters.

f. Any drawings or specifications prepared by [REDACTED] for [REDACTED] use should be completely reviewed by [REDACTED] before they are released for construction.

6.2 Managerial

a. One engineer should be assigned as "project engineer" for each job from its conception to its completion. This individual should be responsible for all RECD external as well as internal project coordination. He should be assigned regardless of engineering branch for he, as "project engineer", would be serving primarily in a managerial rather than technical capacity. He would, however, continue to serve in his area of technical speciality. Such a procedure would insure continuity, fix responsibility, and improve project coordination.

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b. When any RECD representative has conversations with field personnel which might be construed to commit RECD to some course of action, a Memorandum of Conversation should be written and sent to the field for concurrence. This would prevent misunderstandings concerning RECD construction commitments.

c. Prior to the TDY of any RECD engineer to the field, he and his supervisor should prepare a guideline outlining his field mission, functions, and authorities. A copy of this guideline would then be forwarded to the area division and COS. The preparation of this document would insure that the individual and his supervisor agree as to the individual's intended field activities. For the COS, this document would serve as an introduction to the individual and insure that there would not be any misunderstandings regarding the individual's future actions.

d. Independent relationships should be established with several world-wide contractors capable of performing "turn-key" jobs. Such relationships, restricted to the highest members of the company, would provide a means whereby jobs requiring minimum construction times could be "controlled" directly by RECD rather than through a third party. Such an arrangement would

[REDACTED]

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APPENDIX A

11 September 1966

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Dear (Chief, [REDACTED]),

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Attached are the comments by [REDACTED] personnel here concerning the [REDACTED] Lower Camp preliminary drawings.

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Two points are of particular concern to (COB). First, the possible contamination of the spring from our cess pools (Comment a, Sheet 11-04-01-1C1), and second, the need for more room for expansion of the student quarters (Comment g, Sheet 16-06-10-2C). (COB), [REDACTED] and I will check into these two items and forward our comments to you as soon as possible.

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I hope [REDACTED] Electrical Engineer) found time to review these drawings while in (Capital City). If not, he can do so here.

Sincerely,

[REDACTED]

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11 September 1966

U/A COMMENTS

<u>Sheet</u>	<u>Comment</u>
11-01-01 1C	<ul style="list-style-type: none">a. Dip section should be indicated on plan view.b. WWF in the Dip slab and temperature steel in the Dip Edge Beam are required.c. Rip rap should be used on both sides of the Dip section.d. Steel dowels should be used at the transverse contraction joints to prevent differential settlement when cracking occurs.
16-06-01 1C	<ul style="list-style-type: none">a. Structural details of the culverts of and culvert headwalls should be provided.b. Rip rap should be provided at the downstream end of all culverts to prevent undermining.c. An (Eastern) washcar should be provided in the Industrial Area near the (Western) washcar (GFE).d. An "A" frame for unloading cargos should be provided near the warehouse. (District Office) has sketches.e. There must be facilities either inside or near the Motor Pool for washing vehicles.
16-06-01 2C	<ul style="list-style-type: none">a. The Commo car must be moved to a location on a hill slightly to the south of the site. It will be necessary to construct several antenna foundations and a commo cable system between the Upper and Lower Camps.b. The Recreation Building should face the roadway.c. Bldgs. 110 through 114 should exit on a walkway running between these Bldgs. and Bldg. 115 through 118.

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<u>Sheet</u>	<u>Comment</u>
16-06-01 2C	d. Bldgs. 115 through 118 all face Bldgs. 110 through 114. Hence the walkway behind Bldgs. 115 through 118 should be eliminated. e. The drive between Bldgs. 118 and 119 is for garbage pickup only. f. The walkway between Bldgs. 122 and 123 should extend not only to Bldgs. 120 and 121, but also to the front of Bldg. 119, and thence down steps to the roadway and parking area. g. It may be necessary to increase the area between Bldgs. (115 - 118) and Bldg. (109 - 114) to provide for expansion of the student area.
16-06-01 5C	a. Culvert encasement should indicate reinforcement. b. Culvert should have rip rap at downstream face to prevent undercutting. c. Manhole base should indicate reinforcement.
11-04-01 1C1	a. The cesspools appear to be located near the source of the spring which will be used for water supply. Contamination of the spring may result. Recommendations will be made to [REDACTED]
11-04-01 1E3	a. Bldgs. should be grounded. 25X1C
26-03-02 1S1	a. A fuel line trench should be provided. b. Pad bolt spacing is incorrect. See OCE Dwg. No. 346-9, 3/17/66.
26-03-02	a. Generator sizes indicated are incorrect. See OCE Dwg. No. 346-9, 3/17/66. Apparently, the wrong OCE powerhouse drawing was copied.

In addition to the above comments, the following OCE drawings have not been incorporated in the plans:

Maintenance Bldg. Layout	OCE 346-12	4/8/66
Warehouse Layout	OCE 346-13	4/8/66

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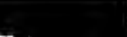
Motor Pool Electrical	OCE 346-11A	4/8/66
Warehouse Electrical	OCE 346-13A	4/8/66
Maintenance Bldg. Electrical	OCE 346-12A	4/8/66
Motor Pool Bldg. Layout	OCE 346-11	4/8/66
Lower Camp Plumbing	OCE 346-4B	6/5/66


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APPENDIX B

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 LOWER CAMP
 CHANGE ORDERS
 15 Jan 67

No.	Item	Status
1.	Movement of Industrial Area Bldgs. and some roads approximately 15.0m west, 5.0m south, 14 Oct 66.	Complete
2.	Relocation of some Housing Area palletizers, 16 Nov 66.	Complete
3.	Addition of reinforcement to Roadway Dip Section and revision of generator pad anchor bolts, 16 Nov 66.	<u>Cancelled</u>
4.	Addition of tie-down hooks to center palletizer support on all palletizers, 17 Nov 66.	Complete
5.	Installation of drop manholes at Manholes No. 5 and 6, Lower Camp Housing Area, 17 Nov 66.	Complete
6.	Construction of foundation for GFM "A" frame, 20 Nov 66.	In Progress
7.	Construction of vehicle wash stand to be located near Industrial Area Motor Pool, 20 Nov 66. (As amended)	In Progress
8.	Elimination of one the Industrial Area Leaching Cesspools, 20 Nov 66.	Complete
9.	Realignment of the site access road so as to terminate at the (Main) Road, 27 Nov 66.	Complete
10.	Construction of two additional single culverts on the site access road, 27 Nov 66.	Complete
11.	Construction of four CM antenna foundations, 27 Nov 66.	Complete
12.	Correction of rafter fabrication error for  Maintenance Bldg., 28 Nov 66.	Complete
13.	Deletion of water connection to Bldg. No. 116, Lab, 5 Dec 66.	<u>Cancelled</u>
14.	Addition of Manholes No. 7, 8, and 9 to Housing Area sewer line, 5 Dec 66.	Complete

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No.	Item	Status
15.	Deletion of two Street "A" culverts and one Access Road culvert, 5 Dec 66.	Complete
16.	Installation of two drop manholes in Industrial Area sewer line, 8 Dec 66.	Complete
17.	Installation of Grease Trap for both Mess Bldgs., 10 Dec 66.	Complete
18.	Removal of four, 4-71 Generator Sets from Upper Camp Powerhouse and installation of said generators in Lower Camp Powerhouse, 10 Dec 66.	Complete
19.	Installation of GFM 10,000 liter fuel tank at Lower Camp Powerhouse, 15 Dec 66.	In Progress
20.	Installation of GFM 4,000 liter fuel tank and 50m of Contractor-furnished distribution line in Housing Area, 15 Dec 66. (As amended)	In Progress
21.	Construction of 1353m of 7-strand barbed wire fence with drop-bar gate, 20 Dec 66.	In Progress
22.	Erection of GFM chain link fence around Commo Palletizer No. 123, 21 Dec 66.	In Progress
23.	Increase in length of GFM chain link fence around Water Supply Area, 21 Dec 66.	<u>Cancelled</u>
24.	Construction of 200m of protective rip-rap drainage ditches around the Industrial Area, 25 Dec 66. (As amended)	In Progress
25.	Construction of Motor Pool Grease Pit wall voids for future light and receptacle installation, 25 Dec 66.	Complete
26.	Installation of A/C water lines up to nine Housing Area Buildings, 25 Dec 66.	Complete

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